

NOTICE

All drawings located at the end of the document.

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**Task-Specific Health and Safety Plan Addendum
for Planned Intrusive Activities in the
Solar Ponds Plume Area, February 1998**

**Rocky Flats Environmental Technology Site
Golden, Colorado**

**Revision O
February 9, 1998**

**ADMIN RECD
1101-B-00005**

**Well Abandonment and Replacement Program
Task-Specific Health and Safety Plan Addendum
Job No CK350000**

1 Items 1-9 to be completed by RMRS Task Project Manager

Project Name North Walnut Creek Nitrate Groundwater Plume Evaluation

Task This Task-Specific Health and Safety Plan Addendum (HASP) is only for the work to be conducted for the implementation of the "Sampling and Analysis Plan for Groundwater Sampling and Well Installation in the Solar Ponds Area" (RF/RMRS-97-136). The well installation outlined in the SAP is designed to allow further delineation of the extent of the nitrate and uranium in the groundwater of the Solar Ponds and North and South Walnut Creek areas (referred to as the Solar Ponds Plume (SPP)). The scope of the proposed activity is installation of five monitoring wells using a Geoprobe. No wastes will be generated during the proposed activities and only sample cores will be retained. Activities described in this Task-Specific HASP will be performed under the direction of RMRS Environmental Restoration Projects personnel.

Requested By Kelly Hranac

Proposed Start-Up Date February 9, 1998

Reviewed by RMRS Health and Safety Supervisor

Printed Name DAVID FARLER
Signature [Signature]

Date 2/10/98

Approved by RMRS Task Project Manager

Printed Name Kelly Hranac
Signature [Signature]

Date 2/10/98

Approved by RMRS Quality Assurance/Quality Control

Printed Name Gary D. Gregori
Signature [Signature]
Title Quality Assurance Engineer

Date 2/10/98

Approved by Radiological Engineer

Printed Name M-B ESTABROOKS
Signature [Signature]
Title RAD- ENG.

Date 2/10/98

Note to Project Manager A signed and completed copy of the Health and Safety Plan and a signed and completed copy of the safety briefing must be included in the project file.

2 Project Description

This HASP addendum covers the drilling and installation of five groundwater monitoring wells in the Solar Ponds Plume area in February 1998 using a Geoprobe. The objective of this work is to collect groundwater samples in areas of the alluvium or weathered bedrock where wells are not present and analyze them for uranium isotopes and nitrate/nitrite. This data will be used to help characterize the Solar Ponds Plume and evaluate the remedial alternatives retained in the RMRS/RTG study which assessed alternatives for management and treatment of the water collected by the Interceptor Trench System (*Solar Ponds Plume Remediation and Interceptor Trench System Water Treatment Study*, RMRS/RTG, September 1997).

This addendum covers only borehole advancement using a Geoprobe and well installation in the boreholes; these activities are being conducted as part of the Solar Ponds Plume characterization. The groundwater sampling of these wells is covered by the general Groundwater Sampling HASP. All sample analyses will be conducted as described in the SAP for groundwater sampling at the Solar Ponds (RMRS, 1998) and interpretation of the data will be the responsibility of RMRS.

All activities described in this addendum will be conducted in accordance with this addendum, and the HASP for the 1996 WARP. The activities are substantially similar in scope and potential hazard as those described in the geotechnical boring subtask described in the WARP HASP. All activities described in this addendum will be performed by or at the direction of Environmental Restoration Projects personnel.

Project contacts and emergency phone numbers are listed in Table 1.

Description of Planned Intrusive Activities

A van mounted Geoprobe sampling rig will be used for borehole advancement. The rig will be used to make boreholes in which groundwater monitoring wells will be installed. The equipment will be operated in accordance with procedure 4-S64-ER-OPS-GT 39 Push Subsurface Soil Sample. The direct push method employed by the rig will not generate waste cuttings or airborne dust. The soil will be enclosed in liners contained within the Geoprobe assembly. The soil will be logged and the cores will be sent to the core library upon project completion. The wells will be constructed using slotted PVC screen and well casing. The annulus from the bottom of the borehole to approximately one foot above the screen will be filled with appropriately-sized sand filter pack. The remainder of the annulus will be filled with bentonite. Collection of groundwater samples will be performed under the Groundwater Sampling HASP.

3 Location

This Task-Specific HASP Addendum covers planned well installation activities to be performed within the Solar Ponds Plume area, as shown on Figure 1. One well will be installed in the North Walnut Creek drainage to the southeast of the Modular Storage Tanks, one well will be installed to the east of Building 995, three wells will be installed to the southeast of Pond 207B-South, within the Protected Area (PA).

4 Facility Work Site Description

The Solar Evaporation Ponds (Solar Ponds) are located in the northeastern corner of the Protected Area. The five ponds were used to store and evaporate radioactive process water from the 1950s to 1986. Cleanup activities began in 1985 to drain and remove sludges from the five ponds and the Building 788 Clarifier. The sludges were processed to produce "pondcrete" blocks. In 1993, the remaining sludges were collected via vacuum trucks and contained in 66 10,000-gallon capacity storage tanks. These tanks are currently stored on the 750 Storage Pad. Additional remediation activities to remove contaminated soils, equipment, and structures are proceeding.

The Solar Ponds Plume, or SPP, emanates from the ponds. The SPP is being evaluated separately from the Solar Ponds themselves. The primary contaminants of the SPP are nitrate and uranium. The plume extends northward from the Solar Ponds to North Walnut Creek and to the southeast, towards South Walnut Creek. Volatile organic compounds (primarily trichloroethylene [TCE], tetrachloroethylene [PCE], carbon tetrachloride [CCl₄], 1,1-dichloroethylene [1,1-DCE], and chloroform) have been detected at parts per billion concentrations in wells located in the area of the western Solar Ponds and to the southeast of the Solar Ponds. This VOC contamination is not thought to have originated at the Solar Ponds, but from

(Addendum to Health and Safety Plan for the 1996 WARP, April 1996, RF/ER-96-0016)

source areas to the west and southeast. Exceedances of the RFCA groundwater action levels for several metals have also been detected.

An Interceptor Trench System (ITS) was installed in 1971 and expanded in 1981 to prevent the SPP from reaching North Walnut Creek. This system of trenches and drains traverses the hillside to the north of the Solar Ponds and collects both surface water infiltration and groundwater. The collected water is pumped to three Modular Storage Tanks on the hill above North Walnut Creek (Figure 1) and is currently being evaporated in Building 374. The ITS effectively dewateres the alluvium in the north hillside area, however, contaminated groundwater in the weathered bedrock directly below the alluvium may continue movement toward North Walnut Creek.

5 Project Organization

The project organization is shown in Figure 2. The responsibilities of the personnel shown on the organization chart as they apply to implementation of this HASP Addendum are summarized below.

Project Manager Kelly Hranac

Responsibilities Performing periodic on-site inspections to ensure compliance with HASP, coordinating with health and safety (H&S) supervisor on H&S issues, ensuring that resources are available for all H&S requirements.

Health and Safety Supervisor Dave Farler

Responsibilities Performing review and approval of HASP field changes, evaluating RMRS and subcontractor work to verify compliance with the requirements of this HASP Addendum, performing inspections for proper and appropriate use of personal protective equipment, monitoring and decontamination procedures, site control, and required documentation, alerting the project manager and the H&S manager of health and safety violations.

Field Manager Tim Lovseth

Responsibilities Ensuring job site safety and implementing this HASP Addendum, making certain that the scope of work described in the Sampling and Analysis Plan is met, informing facility personnel of activities that will be carried out in a particular area, ensuring site permits are obtained before work begins at each site, communicating with the HSS about the schedule of work, and verifying training/medical documentation and releases.

Quality Assurance/Quality Control Manager Greg DiGregorio

Responsibilities Ensuring that all documents used in the field are controlled copies, making certain that the project documents contain required QA/QC procedures.

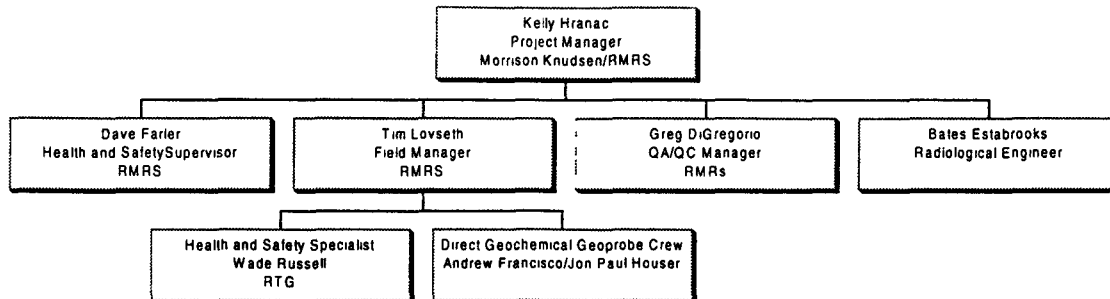
Health and Safety Specialist Wade Russell

Responsibilities Assist project and field managers in implementing this HASP Addendum, provide a copy of the WARP HASP and this Addendum to all field crews, maintain site H&S records, immediately report all safety-related incidents or accidents to the project manager, direct H&S activities and conduct staff training, ensure that current medical and training documentation is available, provide onsite air monitoring for radiological and chemical contaminants during field activities using real-time instrumentation, monitor workers for heat or cold stress, oversee contamination reduction, suspend work or limit personnel exposures if health and safety is endangered or a work condition is radiologically unsafe, direct personnel to change hazardous work practices, remove personnel from projects if their actions endanger the environment, their or others' health and safety, implement emergency procedures as required, implement radiological guidelines and coordinate activities to limit radiation exposures to levels that are as low as reasonably achievable.

Geoprobe Crew Andrew Francisco and Jon Paul Houser

Responsibilities Drill and install wells according to site procedures and the sampling and analysis plan, follow the directions of the Field Manager and HSS, conduct all work in a safe and responsible manner.

Figure 2 Project Organizational Chart



6 Confined Space Entry

A confined space is defined as 1) large enough to enter, 2) limited access/egress, and 3) not intended for human occupancy (CFR1910 146[b]). Confined spaces include, but are not limited to, storage tanks, process vessels, bins, boilers, ventilation or exhaust ducts, air pollution control devices, smoke stacks, underground utility vaults, sewers, septic tanks, and open top spaces more than four feet in depth such as test pits, waste disposal trenches, sumps and vats. The work outlined in this Task-Specific HASP Addendum will not require entry into confined or partially confined spaces.

7 Cutting and Welding

The work outlined in this Task-Specific HASP Addendum will not require use of a cutting torch or welding.

8 Other Potential Hazards

The potential hazards that may be encountered during the execution of the work covered by this Task-Specific HASP Addendum include the following:

- Chemical Hazards
- Radiological Hazards
- Cold Stress
- Machinery/Mechanical Equipment
- Trips, Slips, and Falls
- Unstable/Uneven Terrain

Hazard Summary This work involves potential contact with soil and/or groundwater containing concentrations of chemicals in the parts per billion range ($\mu\text{g/kg}$ or $\mu\text{g/L}$), nitrate/nitrite in the parts per million range (mg/kg or mg/L) and radioisotopes in the picoCuries per gram or liter (pCi/L or pCi/g) range. Site-specific soil and water data from the areas near where the wells will be installed is provided in Table 1. Particular attention will be paid to dust suppression and air monitoring activities at locations which could potentially produce contaminated soil or groundwater. Personnel will use real-time air monitoring for dust and volatile organic compounds to determine when and if changes in personal protective equipment (PPE) or engineering controls are necessary. Table 2 summarizes potential contamination hazards and Table 3 summarizes chemical hazards. Task-specific hazards, controls, PPE, and the task-specific Activity Hazard Analysis are provided in Appendix A.

(Addendum to Health and Safety Plan for the 1996 WARP, April 1996, RF/ER-96-0016)

Table 1 Maximum Detected Contaminant Concentrations in Soil and Groundwater near Proposed Well Locations

Analyte	Surface Soil	Subsurface Soil	Groundwater
Barium	ND	134 mg/kg	26 B µg/L
Cadmium	ND	1 6 mg/kg	ND
Chromium	ND	ND	4 9 B µg/L
Lithium	ND	10 9 mg/kg	666 µg/L
Nitrate	83 3 mg/kg	45 9 mg/kg	2 4 µg/L
Selenium	ND	ND	14 3 µg/L
Silver	2 2 mg/kg	ND	ND
Zinc	ND	49 8 mg/kg	ND
Gross Alpha	36 +/- 4 6 pCi/g	NA	NA
Gross Beta	NA	37 +/- 5 2 pCi/g	NA
Americium 241	0 52 +/- 0 053 pCi/g	NA	NA
Plutonium	0 12 +/- 0 022 pCi/g	NA	NA
Tritium	940 +/- 300 pCi/g	520 +/- 310 pCi/g	NA
Uranium 233/234	12 +/- 0 2 pCi/g	1/8 +/- 0 48 pCi/g	80 85 pCi/L
Uranium 235	0 05 +/- 0 034 pCi/g	0 063 +/- 0 026	2 19 pCi/L
Uranium 238	1 5 +/- 0 23 pCi/g	1 8 +/- 0 49	49 93 pCi/L
Toluene	NA	330 µg/kg	0 3 J µg/L
Acetone	NA	27J µg/kg	1 J µg/L
Benzo(b)fluoranthene	52 J µg/kg	ND	ND
Benzo(k)fluoranthene	62 J µg/kg	ND	ND
Carbon Tetrachloride	ND	ND	0 1 J µg/L
Chloroform	ND	ND	0 5 J µg/L
Fluoranthene	43 J µg/kg	ND	ND
Hexachlorobutadiene	ND	ND	0 1 J µg/L
Methylene Chloride	NA	9 µg/kg	2 µg/L
Naphthalene	ND	ND	3 B µg/L
Phenanthrene	41 J µg/kg	ND	ND
Pyrene	54 J µg/kg	ND	ND
Tetrachloroethene	ND	ND	0 4 J µg/L
Trichloroethene	ND	ND	0 1 µg/L

ND = not detected NA = not analyzed J = below detection limit B = below detection limit (inorganic)
detected in lab blank (organic)

Primary Hazards

The risks posed by all primary hazards expected to be encountered during the execution of the work covered by this Task-Specific HASP Addendum are considered low. The table below describes potential contamination hazards.

Table 2 Potential Contamination Hazards

Task Description	Potential Contaminants	PPE to be Used
Disturbance of subsurface soil by Geoprobe, installation of monitoring wells	Low levels of nitrate, organics, and radionuclides in unsaturated soil, low to high levels of nitrate and uranium, low levels of organics in groundwater	Start in modified Level D: hard hats, safety glasses with side shields, hard toed shoes, orange vest during spotting Geoprobe, DOE coveralls, inner nitrile gloves, hearing protection, and leather gloves near pinch hazards or sharp edges. If air levels are exceeded, work will be paused and reevaluated by the HSS and/or Radiological Engineer.

9 Ambient Air/Site Monitoring Procedures

The following instruments shall be used to monitor the work environment and workers' breathing zones prior to the site entry and at the specified intervals

Instrument	Monitoring Frequency
Noise dosimeter	Initially and during operation of equipment
PID/FID	Monitor breathing zone during removal of core
Mini-ram dust monitor	Monitor breathing zones every 30 minutes or when visible dust is present
Radiological instruments	Initial survey, when pushing in subsurface

10 Action Levels

Task personnel will modify working conditions or personal protective equipment based on the following action levels

Instrument	Action Level	Specific Action
Noise dosimeter	≥ 85 dBA as an 8-hour average	If readings exceed action level, personnel must be included in a hearing conservation program
Sound level meter	85 dBA	If readings exceed action level, hearing protection required, posting of High Noise Area required
MIE PDM-3dust monitor	1.5 mg/m ³ sustained dust levels	If sustained readings above 1.5 mg/m ³ are measured in breathing zone, apply dust suppression and soil wetting techniques using small sprayer or other equipment
PID/FID with 11.7 eV lamp	Any sustained readings above background in the breathing zone	If sustained readings above the action level are measured, discontinue work and contact the Health and Safety Supervisor
Ludlum 2929 (smears to confirm removal of removable radioactivity)	<u>Smears-minimal detectable activity</u> Alpha <18 dpm per 100 cm ² Beta <205 dpm per 100 cm ²	If the smear doesn't meet these levels, work will be put on hold. The piece of equipment which did not pass will be decontaminated and smeared again.
Electra alpha/beta/gamma screening instrument	<u>Direct Surveys</u> Beta <455 dpm per 100 cm ² total activity Alpha <93.3 dpm per 100 cm ² total activity	If these values are exceeded, work will stop and the situation will be reevaluated. An RWP may be necessary.

11 Personal Monitoring

No personal monitoring will be conducted during this field event

12 Biological Monitoring/Medical Surveillance

This project does not require medical surveillance or biological monitoring procedures beyond the routine medical surveillance program

13 Onsite Control

Control boundaries will be established, as described in the WARP HASP. Work zones will be clearly labeled and an Exclusion Zone of 10 feet will be maintained around the intrusive activity.

Wade Russell has been designated to coordinate access control on the work site during the borehole drilling and well installation activities.

14 Personal Protective Equipment

Level D personal protective equipment will be used for all activities covered by this HASP Addendum, unless air monitoring results exceed the action levels. In this case, PPE will be upgraded or working conditions altered, according to directions from the on-site HSS and/or Radiological Engineer.

Level D PPE will consist of the following: hard hats, safety glasses with side shields, hard-toed shoes, orange vest during spotting Geoprobe, DOE coveralls, inner nitrile gloves, hearing protection, and leather gloves near pinch hazards or sharp edges.

15 Decontamination

Formal decontamination procedures are not expected to be necessary during performance of the work outlined in this HASP. Personnel will remove gloves using work practices which minimize contact between the outside of the gloves and the skin. If chemical or radiological contamination is suspected, follow guidance in Section 6.5.1 of the WARP HASP.

16 Special Instructions

Any hazards that may be encountered which are of an unusual nature or which represent an unknown threat will be managed in accordance with this RMRS policy statement: "In the event unanticipated hazards or conditions are encountered, the project activities will pause to assess the potential hazard or condition. The potential hazard or condition will be evaluated to determine the severity or significance of the hazard or condition and whether the controls on the project are sufficient to address the hazard or condition. Based on this initial evaluation, a determination will be made whether to proceed with controls currently in place, segregate the hazard or condition from the project activity, if it can be done safely, or curtail operations to address the unexpected hazard or condition. Concurrence to proceed down the selected path must be obtained from the RMRS Vice President or his/her designee. In addition, the resumption of field activities involving radiological issues will be in accordance with Article 345 of the RFETS Radiological Control Manual."

17 Sanitation Requirements

For each work area, arrangements will be made with nearby buildings for the use of toilet and washing facilities. The locations of these facilities will be specified at the morning tool box safety meetings.

THIS PAGE TO BE POSTED IN A PROMINENT LOCATION ON SITE

18 Emergency Procedures

On-site communications are required when installing the well in the Buffer Zone, near the Modular Storage Tanks. **The emergency channel for the radio while in the Buffer Zone is 2911**

While in the Protected Area installing the wells southeast of the Solar Ponds, telephones are located at Buildings 910 and 991

The nearest telephone to the well location to be installed near Building 995 is Building 995

Fire or Explosion

In the event of fire or explosion, if the situation can be readily controlled with available resources without jeopardizing the health and safety of yourself, the public, or other site personnel, take immediate action to do so if currently trained, otherwise

- 1 Notify emergency personnel by calling 2911
- 2 If possible, isolate the fire to prevent spreading. Evacuate the area

On-Site Injury or Illness

In the event of an injury, or any employee reporting any sign or symptom of exposure to hazardous substances, immediately take the victim to the RFETS Medical Facility located at Building 122 (Figure 1 1), phone x2594. In the event of life-threatening or traumatic injury, implement appropriate first-aid and immediately call for emergency medical assistance at 2911

Designated Personnel Current in First Aid/CPR Wade Russell

THIS PAGE TO BE POSTED IN A PROMINENT LOCATION ON SITE

Table 1 Emergency Contact Telephone/Pager Numbers

Fire	x 2911
Poison Center	629-1123
Ambulance	x 2911
Security	x 2911

Nearest emergency medical services are located at Building 122 as shown on the attached map

Communications

The HSS will be equipped with a radio (r3728) and will be using channel 11. If contact with other plant or emergency personnel is required, the HSS will make these contacts.

Emergency Response Authority

Wade Russell is the designated site emergency response coordinator and has final authority for first response to on-site emergency situations. Upon arrival of the appropriate emergency response personnel, the site emergency coordinator will contact the Project Manager and the Health and Safety Supervisor.

Project Telephone Numbers

Vice President - ER - John Law	x 8760/d4564
Project Supervisor - John Hopkins	x 4974/d1577
Project Manager - Kelly Hranac	x 7400
Field Manager/Geologist - Tim Lovseth	x 8249/d5134
Safety Team Lead - Ken Jenkins	x 5374/d7455/r4505
H&S Supervisor - Dave Farler	x 4340/d5248/r3743
HSS/ Site Safety Officer - Wade Russell	x 5356/d6136/r3728
HAZMAT Emergency Response	x 2911/r2911
RFETS Shift Supervisor	x 2914/r3301
Occupational Health General Information	x 2594
Radiological Engineer - Bates Estabrooks	x3769/d7094

Note d = digital page, the digital page system can be activated on plantsite by dialing extension 4000, then following the instructions
r = radio number

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APPENDIX A

Site Location: Solar Ponds, Building 995, Southeast of Modular Storage Tanks

Description Drilling of boreholes with Geoprobe and installation of monitoring wells

Monitoring Requirement							
	PEL	Instrument	Range	Level D Mod	Level C	Level B	Notes
Noise	85 dBA	Noise dosimeter	80-140 dBA	NA	NA	NA	Hearing protection required for any work area having noise exceeding 85 dBA Inclusion in a hearing conservation program is required if noise levels exceed the PEL
Radioactivity	Minimal Detectable Activity Alpha <18dpm/100cm ² Beta <205 dpm/100cm ²	Ludlum 2929 (smears)	NA	NA	NA	NA	If smear does not meet minimal detectable activity, work will be put on hold and equipment will be decontaminated and smeared again
Radioactivity	Total Activity Alpha <93 3 dpm/100cm ² Beta < 455 dpm/100cm ²	Electra alpha/beta/gamma screening instrument	NA	NA	NA	NA	Work will stop and the situation reevaluated if these values are exceeded An RWP may be necessary
Particulates (nitrate in soil)	3 mg/m ³	MIE PDM-3 dust monitor	0 1 100 mg/m ³	NA	1 5 mg/m ³	NA	Misting will be used to control dust if readings 1 5 mg/m ³ or above are measured

Personal Monitoring No personal monitoring will be performed during this work

Personal Protective Equipment													
Type of Work	Level D DOE Coveralls	Level D Modified	Tyvek Coveralls	Saranex Coveralls	Nitrile Gloves	Silvershield Gloves	Latex Gloves	Leather Work Gloves	Face Shield	Rubber Apron	Rubber Boots	Full Face Respirator	Level B Supplied Air
Drilling/Logging Core	✓				✓			✓					
Installing Monitoring Wells	✓				✓			✓					
Decontaminating Equipment	✓				✓								

Heavy duty leather work gloves are required when pinch hazards and sharp edges exist

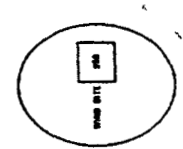
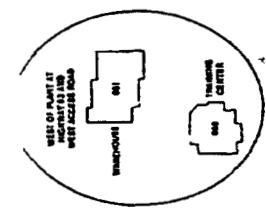
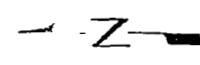
PEL = permissible exposure limit

dpm/100cm² = disintegrations per minute per 100 centimeters squared

mg/m^3 = milligrams per cubic meter

Activity	Potential Hazard	Protective Control Measures
Borehole drilling with Geoprobe and monitoring well installation	Slips, trips, and falls	Pre-activity work area survey to identify potential hazards associated with operations
	Exposure to air-borne radioactive or chemical contaminants	On-site real-time air monitoring will be conducted as discussed in this HASP
	Dermal exposure to radioactive or chemical contaminants in soil and groundwater	Conduct real-time monitoring as discussed in this HASP and wear appropriate PPE, as outlined in HASP or directed by HSS
	Mechanical/hydraulic hazards	Conduct pre-work safety discussion and operate in accordance with GT 039
	Pinching hazards	Conduct pre-work safety discussion, operate in accordance with GT 039, and wear heavy duty leather work gloves where pinch hazards exist
	Noise exposure	Wear hearing protection during operation of Geoprobe
	Electrical hazards, underground/above-ground utilities	Have all well locations cleared by site utility clearance department and have all field personnel present during borehole clearing
	Vehicular and pedestrian traffic	Clearly mark extent of work area around well location and discuss traffic issues at pre-work safety meeting (using care when stepping away from the work area) Orange vests will be worn by personnel spotting during backing up of the Geoprobe
	Manual material lifting	Personnel will follow safe lifting practices per Section 5 35 of WARP HASP
	Thunderstorms and lightening	Pre-work discussion to discuss awareness and follow Section 5 7 2 of WARP HASP
	Falling objects	Hard hats, steel-toed boots, safety glasses will be worn as discussed in this HASP Addendum
	Biological hazards	Pre-work discussion to ensure awareness
	Cold stress	Pre-work discussion to ensure awareness, follow guidance in Section 5 7 1 of WARP HASP
Equipment Decontamination	Contact with potentially contaminated rinse water and high pressure steam	HSS will ensure that personnel are wearing appropriate PPE, decon procedures in Section 6 5 of WARP HASP will be followed

XXX



EMERGENCY ROUTE TO BD 122



